

P1 1170757

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THE UNITED STATES OF AMERICA

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**UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office**

May 18, 2004

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THE RECORDS OF THE UNITED STATES PATENT AND TRADEMARK
OFFICE OF THOSE PAPERS OF THE BELOW IDENTIFIED PATENT
APPLICATION THAT MET THE REQUIREMENTS TO BE GRANTED A
FILING DATE.**

APPLICATION NUMBER: 10/406,336

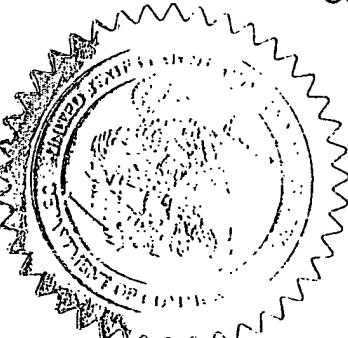
FILING DATE: April 03, 2003

RELATED PCT APPLICATION NUMBER: PCT/US04/09471

**By Authority of the
COMMISSIONER OF PATENTS AND TRADEMARKS**



**T. LAWRENCE
Certifying Officer**



**PRIORITY DOCUMENT
SUBMITTED OR TRANSMITTED IN
COMPLIANCE WITH
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04/03/03
U.S. PATENT AND TRADEMARK OFFICE

10406336 040303
A
PTO/SB/05 (03-01)
Approved for use through 10/31/2002. OMB 0651-0032

U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE

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**UTILITY
PATENT APPLICATION
TRANSMITTAL**

(Only for new nonprovisional applications under 37 CFR 1.53(b))

APPLICATION ELEMENTS <small>See MPEP chapter 600 concerning utility patent application contents.</small>		ADDRESS TO: Assistant Commissioner for Patents Box Patent Application Washington, DC 20231	
<p>1. <input checked="" type="checkbox"/> Fee Transmittal Form (e.g., PTO/SB/17) <i>(Submit an original and a duplicate for fee processing)</i></p> <p>2. <input checked="" type="checkbox"/> Applicant claims small entity status. See 37 CFR 1.27.</p> <p>3. <input checked="" type="checkbox"/> Specification [Total Pages] (preferred arrangement set forth below) <ul style="list-style-type: none"> - Descriptive title of the invention - Cross Reference to Related Applications - Statement Regarding Fed sponsored R & D - Reference to sequence listing, a table, or a computer program listing appendix - Background of the Invention - Brief Summary of the Invention - Brief Description of the Drawings (if filed) - Detailed Description - Claim(s) - Abstract of the Disclosure </p> <p>4. <input type="checkbox"/> Drawing(s) (35 U.S.C. 113) [Total Sheets]</p> <p>5. Oath or Declaration [Total Pages] <ul style="list-style-type: none"> a. <input checked="" type="checkbox"/> Newly executed (original or copy) b. <input type="checkbox"/> Copy from a prior application (37 CFR 1.63 (d)) <i>(for continuation/divisional with Box 18 completed)</i> <ul style="list-style-type: none"> i. <input type="checkbox"/> DELETION OF INVENTOR(S) Signed statement attached deleting inventor(s) named in the prior application, see 37 CFR 1.63(d)(2) and 1.33(b). </p> <p>6. <input type="checkbox"/> Application Data Sheet. See 37 CFR 1.76</p>		<p>7. <input type="checkbox"/> CD-ROM or CD-R in duplicate, large table or Computer Program (Appendix)</p> <p>8. Nucleotide and/or Amino Acid Sequence Submission (if applicable, all necessary) <ul style="list-style-type: none"> a. <input type="checkbox"/> Computer Readable Form (CRF) b. Specification Sequence Listing on: <ul style="list-style-type: none"> i. <input type="checkbox"/> CD-ROM or CD-R (2 copies); or ii. <input type="checkbox"/> paper c. <input type="checkbox"/> Statements verifying identity of above copies </p>	
ACCOMPANYING APPLICATION PARTS			
<p>9. <input type="checkbox"/> Assignment Papers (cover sheet & document(s))</p> <p>10. <input type="checkbox"/> 37 CFR 3.73(b) Statement <input type="checkbox"/> Power of Attorney (when there is an assignee)</p> <p>11. <input type="checkbox"/> English Translation Document (if applicable)</p> <p>12. <input type="checkbox"/> Information Disclosure Statement (IDS)/PTO-1449 <input type="checkbox"/> Copies of IDS Citations</p> <p>13. <input type="checkbox"/> Preliminary Amendment</p> <p>14. <input type="checkbox"/> Return Receipt Postcard (MPEP 503) <i>(Should be specifically itemized)</i></p> <p>15. <input type="checkbox"/> Certified Copy of Priority Document(s) (if foreign priority is claimed)</p> <p>16. <input type="checkbox"/> Nonpublication Request under 35 U.S.C. 122 (b)(2)(B)(i). Applicant must attach form PTO/SB/35 or its equivalent.</p> <p>17. <input type="checkbox"/> Other:</p>			

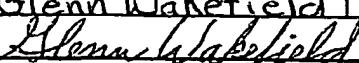
18. If a CONTINUING APPLICATION, check appropriate box, and supply the requisite information below and in a preliminary amendment, or in an Application Data Sheet under 37 CFR 1.76:

Continuation Divisional Continuation-In-Part (CIP) of prior application No. _____

Prior application information: Examiner _____ Group Art Unit: _____
For CONTINUATION OR DIVISIONAL APPS only: The entire disclosure of the prior application, from which an oath or declaration is supplied under Box 5b, is considered a part of the disclosure of the accompanying continuation or divisional application and is hereby incorporated by reference. The incorporation can only be relied upon when a portion has been inadvertently omitted from the submitted application parts.

19. CORRESPONDENCE ADDRESS

<input type="checkbox"/> Customer Number or Bar Code Label				or <input checked="" type="checkbox"/> Correspondence address below	
<p>Name Glenn Wakefield</p> <p>Address 1416 East Carmen Street</p> <p>City Tempe State AZ Zip Code 85283</p> <p>Country USA Telephone 480-839-7094 Fax </p>					

Name (Print/Type)	Glenn Wakefield	Registration No. (Attorney/Agent)
Signature		Date 04/03/2003

Burden Hour Statement: This form is estimated to take 0.2 hours to complete. Time will vary depending upon the needs of the individual case. Any comments on the amount of time you are required to complete this form should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, Washington, DC 20231. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Assistant Commissioner for Patents, Box Patent Application, Washington, DC 20231.

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FEE TRANSMITTAL for FY 2003

Effective 01/01/2003. Patent fees are subject to annual revision.

Applicant claims small entity status. See 37 CFR 1.27

TOTAL AMOUNT OF PAYMENT (\$)

Complete if Known

Application Number	
Filing Date	
First Named Inventor	Glenn Wakefield
Examiner Name	
Art Unit	
Attorney Docket No.	

METHOD OF PAYMENT (check all that apply)

Check Credit card Money Order Other None

Deposit Account:

Deposit Account Number
Deposit Account Name

The Commissioner is authorized to: (check all that apply)

Charge fee(s) indicated below Credit any overpayments
 Charge any additional fee(s) during the pendency of this application
 Charge fee(s) indicated below, except for the filing fee to the above-identified deposit account.

FEE CALCULATION (continued)

3.. ADDITIONAL FEES

Large Entity	Small Entity	Fee Description	Fee Paid
		Fee Code (\$)	Fee Code (\$)
1051 130	2051 65	Surcharge - late filing fee or oath	
1052 50	2052 25	Surcharge - late provisional filing fee or cover sheet	
1053 130	1053 130	Non-English specification	
1812 2,520	1812 2,520	For filing a request for ex parte reexamination	
1804 920*	1804 920*	Requesting publication of SIR prior to Examiner action	
1805 1,840*	1805 1,840*	Requesting publication of SIR after Examiner action	
1251 110	2251 55	Extension for reply within first month	
1252 410	2252 205	Extension for reply within second month	
1253 930	2253 465	Extension for reply within third month	
1254 1,450	2254 725	Extension for reply within fourth month	
1255 1,970	2255 985	Extension for reply within fifth month	
1401 320	2401 160	Notice of Appeal	
1402 320	2402 160	Filing a brief in support of an appeal	
1403 280	2403 140	Request for oral hearing	
1451 1,510	1451 1,510	Petition to institute a public use proceeding	
1452 110	2452 55	Petition to revive - unavoidable	
1453 1,300	2453 650	Petition to revive - unintentional	
1501 1,300	2501 650	Utility issue fee (or reissue)	
1502 470	2502 235	Design issue fee	
1503 630	2503 315	Plant issue fee	
1460 130	1460 130	Petitions to the Commissioner	
1807 50	1807 50	Processing fee under 37 CFR 1.17(q)	
1806 180	1806 180	Submission of Information Disclosure Stmt	
8021. 40	8021 40	Recording each patent assignment per property (times number of properties)	
1809 750	2809 375	Filing a submission after final rejection (37 CFR 1.129(a))	
1810 750	2810 375	For each additional invention to be examined (37 CFR 1.129(b))	
1801 750	2801 375	Request for Continued Examination (RCE)	
1802 900	1802 900	Request for expedited examination of a design application	

SUBTOTAL (1) (\$)

375

2. EXTRA CLAIM FEES FOR UTILITY AND REISSUE

Total Claims	Extra Claims	Fee from below	Fee Paid
Independent Claims	-20** =	<input type="text"/> X <input type="text"/> = <input type="text"/>	
Multiple Dependent	-3** =	<input type="text"/> X <input type="text"/> = <input type="text"/>	

Large Entity	Small Entity	Fee Description
Fee Code (\$)	Fee Code (\$)	
1202 18	2202 9	Claims in excess of 20
1201 84	2201 42	Independent claims in excess of 3
1203 280	2203 140	Multiple dependent claim, if not paid
1204 84	2204 42	** Reissue independent claims over original patent
1205 18	2205 9	** Reissue claims in excess of 20 and over original patent

SUBTOTAL (2) (\$)

0

*or number previously paid, if greater. For Reissues, see above

Other fee (specify) _____

*Reduced by Basic Filing Fee Paid

SUBTOTAL (3) (\$)

0

SUBMITTED BY

(Complete if applicable)

Name (Print/Type)	Glenn Wakefield	Registration No. (Attorney/Agent)	Telephone 480-839-7094
Signature	Glenn Wakefield	Date	04/03/2003

WARNING: Information on this form may become public. Credit card information should not be included on this form. Provide credit card information and authorization on PTO-2038.

This collection of information is required by 37 CFR 1.17 and 1.27. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, Washington, DC 20231. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, Washington, DC 20231.

If you need assistance in completing the form, call 1-800-PTO-9199 (1-800-786-9199) and select option 2.

TITLE OF INVENTION

Magnetically Propelled Capsule Endoscopy

CROSS-REFERENCE TO RELATED APPLICATIONS

Not Applicable

STATEMENT REGARDING FEDERALLY SPONSORED RESEARCH OR DEVELOPMENT

Not Applicable

REFERENCE TO SEQUENCE LISTING, A TABLE, OR A COMPUTER PROGRAM LISTING COMPACT DISC APPENDIX

Not Applicable

BACKGROUND OF THE INVENTION

This patent application applies to the field of medical imaging and tissue biopsy/excision.

Traditionally the digestive tract has been examined by the upper gastrointestinal endoscope and the lower gastrointestinal endoscope and most recently by the capsule endoscope. Upper and lower gastrointestinal endoscopy usually require an anesthetic and are limited by the inability to examine the small intestine. Capsule endoscopy does not practically allow for real time imaging and precludes tissue biopsy/excision. The upper and lower gastrointestinal endoscopy and capsule endoscopy provide a limited range of viewing/access angles.

BRIEF SUMMARY OF THE INVENTION

Magnetically propelled capsule endoscopy provides for the medical examination of the gastrointestinal tract. After the capsule is swallowed, it will be steered throughout the gastrointestinal tract by an externally generated magnetic field. This device will provide real time imagery and position data along with the ability to perform tissue biopsy/excision. This device can be applied to the gastrointestinal tract, reproductive tract, trachea/lungs, vascular system or any accessible body cavity.

BRIEF DESCRIPTION OF THE SEVERAL VIEWS OF THE DRAWING

Not Applicable

DETAILED DESCRIPTION OF THE INVENTION

Magnetically propelled capsule endoscopy allows for a fast, comprehensive medical examination of the digestive tract, reproductive tract, trachea/lungs, vascular system or any accessible body cavity. The capsule is swallowed or appropriately placed in the body. Contained within the small capsule will be:

(#1 possibility) - magnets for movement and directional control; LEDs for lighting and camera for visualization; rf source and receiver to transmit pictures and to communicate;

gyroscope/accelerometer for positional information; mechanical equipment for tissue biopsy/excision or other procedures; power source; electronics;

(#2 possibility) - magnets for movement and directional control; fiber optic light source, fiber optic imaging lens, power lines, communication lines, air hose, and water hose extending out the back of the capsule and connecting to the external control instrument; gyroscope/accelerometer for positional information; mechanical equipment for tissue biopsy/excision or other procedures; electronics.

All of the parts in #1 possibility and #2 possibility, other than the magnets, will be composed of nonmagnetic material or magnetically shielded as required. The #1 possibility is a capsule with no physical connection to the outside in contrast to the #2 possibility that is a capsule that has a physical connection to the outside. The choice of physical connection or not, capsule size and capabilities will vary depending on the part of the body that is being examined by the medical practitioner.

The magnets contained within the capsule will be bathed in an externally generated magnetic field. The external field is created by inscribing six metal rings on the six faces of an imaginary cube. Current is running through each of the six rings which effectively allows a pair of rings to control each dimension. The metal rings are composed of many windings of appropriately coated wire. The patient undergoing the medical examination will be placed inside the six ringed

structure. The capsule will be moved by appropriately changing the current within each ring. As necessary, the actual rings will be moved in conjunction with the changing current. The medical practitioner, using visual feedback, will guide the capsule throughout the body part under examination. The magnetic field strength will be adjusted appropriately for direction change, movement or extra stationary stability for tissue biopsy/excision or other procedures.

The gyroscope/accelerometer will provide the ability to map in real time the positional progress of the capsule. A positional map will be created of the entire exam, areas of interest can be marked, and visual images will be generated corresponding to each positional location of the capsule. A computer generated three dimensional fly through can be created based on the data collected from the examination. All of this data can be appropriately stored for future reference and for comparison with other medical exams.

CLAIMS

I claim:

1. Magnetically propelled capsule endoscopy allows for a fast, comprehensive medical examination of the digestive tract, reproductive tract, trachea/lungs, vascular system or any accessible body cavity. The capsule is swallowed or appropriately placed in the body. Contained within the small capsule will be:

(#1 possibility) - magnets for movement and directional control; LEDs for lighting and camera for visualization; rf source and receiver to transmit pictures and to communicate; gyroscope/accelerometer for positional information; mechanical equipment for tissue biopsy/excision or other procedures; power source; electronics;

(#2 possibility) - magnets for movement and directional control; fiber optic light source, fiber optic imaging lens, power lines, communication lines, air hose, and water hose extending out the back of the capsule and connecting to the external control instrument; gyroscope/accelerometer for positional information; mechanical equipment for tissue biopsy/excision or other procedures; electronics.

All of the parts in #1 possibility and #2 possibility, other than the magnets, will be composed of nonmagnetic material or magnetically shielded as required. The #1 possibility is a capsule with no physical connection to the outside in contrast to the #2 possibility that is a capsule that has a physical connection to the outside. The choice of physical connection or not, capsule size and capabilities will vary depending on the part of the body that is being examined by the medical practitioner.

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ABSTRACT OF THE DISCLOSURE

Magnetically propelled capsule endoscopy provides for the medical examination of the gastrointestinal tract. After the capsule is swallowed, it will be steered throughout the gastrointestinal tract by an externally generated magnetic field. This device will provide real time imagery and position along with the ability to perform tissue biopsy/excision. This device can be applied to the gastrointestinal tract, reproductive tract, trachea/lungs, vascular system or any accessible body cavity.

PTO/SB/01 (10-01)

Approved for use through 10/31/2002. OMB 0651-0032

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DECLARATION FOR UTILITY OR DESIGN PATENT APPLICATION (37 CFR 1.63)		Attorney Docket Number
		First Named Inventor
		<i>Glenn Wakefield</i>
		COMPLETE IF KNOWN
		Application Number
		Filing Date
		Art Unit
		Examiner Name

As the below named inventor, I hereby declare that:

My residence, mailing address, and citizenship are as stated below next to my name.

I believe I am the original and first inventor of the subject matter which is claimed and for which a patent is sought on the invention entitled:

Magnetically Propelled Capsule Endoscopy

(Title of the Invention)

the specification of which

 is attached hereto

OR

 was filed on (MM/DD/YYYY) as United States Application Number or PCT InternationalApplication Number and was amended on (MM/DD/YYYY) (if applicable).

I hereby state that I have reviewed and understand the contents of the above identified specification, including the claims, as amended by any amendment specifically referred to above.

I acknowledge the duty to disclose information which is material to patentability as defined in 37 CFR 1.56, including for continuation-in-part applications, material information which became available between the filing date of the prior application and the national or PCT international filing date of the continuation-in-part application.

I hereby claim foreign priority benefits under 35 U.S.C. 119(a)-(d) or (f), or 365(b) of any foreign application(s) for patent, inventor's or plant breeder's rights certificate(s), or 365(a) of any PCT international application which designated at least one country other than the United States of America, listed below and have also identified below, by checking the box, any foreign application for patent, inventor's or plant breeder's rights certificate(s), or any PCT international application having a filing date before that of the application on which priority is claimed.

Prior Foreign Application Number(s)	Country	Foreign Filing Date (MM/DD/YYYY)	Priority Not Claimed	Certified Copy Attached? YES	Certified Copy Attached? NO
			<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>

 Additional foreign application numbers are listed on a supplemental priority data sheet PTO/SB/02B attached hereto:

[Page 1 of 2]

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DECLARATION — Utility or Design Patent Application

Direct all correspondence to: Customer Number
or Bar Code Label Correspondence address below

Name **Glenn Wakefield**

Address **1416 East Carmen Street**

City Tempe	State AZ	ZIP 85283
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Country USA	Telephone 480-839-7094	Fax
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I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under 18 U.S.C. 1001 and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

NAME OF SOLE OR FIRST INVENTOR: A petition has been filed for this unsigned inventor

Given Name (first and middle [if any]) Glenn Mark	Family Name or Surname Wakefield
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Inventor's Signature Glenn Mark Wakefield	Date 04/03/2003
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Residence: City Tempe	State AZ	Country USA	Citizenship USA
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Mailing Address **1416 East Carmen Street**

City Tempe	State AZ	ZIP 85283	Country USA
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NAME OF SECOND INVENTOR: A petition has been filed for this unsigned inventor

Given Name (first and middle [if any])	Family Name or Surname
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Inventor's Signature	Date
-------------------------	------

Residence: City	State	Country	Citizenship
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Mailing Address

City	State	ZIP	Country
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Additional inventors are being named on the _____ supplemental Additional Inventor(s) sheet(s) PTO/SB/02A attached hereto.